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ABORIGINAL DISTRIBUTION OF *QUERCUS LOBATA* WOODLAND ON THE KAWEAH RIVER DELTA, CALIFORNIA

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ABSTRACT

In 1853 the Kaweah River delta (western Tulare County) was one of California's richest natural habitats, the so-called Giant Oak Forest its leading feature. By 1920 this unique formation was completely cleared, drained, and leveled for intensive agricultural use. We present a reconstruction of the 1853 vegetation pattern based on U.S. General Land Office survey notes.

Key Words: California oak woodlands, deforestation, land use impacts, riparian zones, San Joaquin Valley.

Historically, the delta of the Kaweah River comprised one of California's most productive riparian areas, including the San Joaquin Valley's most extensive stands of *Quercus lobata,* Neé (Fagaceae). With associated belts of grassland and tule marsh, the oak woodland of this inland delta had supported what Cook (1955) identified as the heaviest concentration of aboriginal population in California, "or possibly even north of the Valley of Mexico." Agricultural settlement after 1853 brought gradual clearing of wooded areas for cultivation, along with heavy livestock grazing and diversion of water for drainage and irrigation. The general thinning and deterioration of the oak woodland was noted as early as 1878 (Anonymous 1878); by 1903 only fragments of it survived (Anonymous 1903). By 1921 some 90 percent of the Kaweah's surface flow was diverted and groundwater was subjected to heavy pumping (California Department of Public Works 1922). A soil survey team working here in 1935 attributed the death of the remaining old-growth oaks to abrupt dewatering of the soil profile (Storie et al. 1940).

The aboriginal landscape of the Kaweah delta was obliterated before it was ever mapped; subsequent cartographic depictions were based on little more than guesswork (Preston 1982). In 1853–1854 the area was still public domain and largely free of agricultural disturbance (Blake 1858; Leonard 1928). Surveyors employed by the U.S. General Land Office were establishing the crosshatch of townships and sections that would be the basis of future property description (Gibbes 1854). Their instructions required them to note the vegetation along each linear mile (1.6 km) of the survey grid. These firsthand observations along a permanent cadastral framework constitute a recognized baseline for the evaluation of postsettlement vegetation

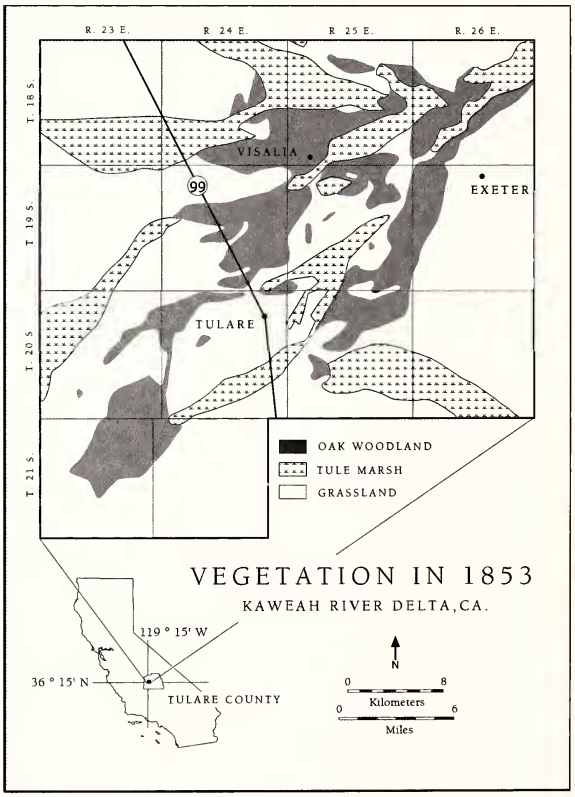

FIG. 1. *Quercus lobata* (valley oak) woodland and associated vegetation types of the aboriginal Kaweah delta, in relation to the U.S. public land survey township grid (U.S. General Land Office 1853–1854), to the modern cities of Visalia, Tulare, and Exeter, and to the route of modern California State Highway 99. The North (Main) Branch of the Tule River joins the delta system from the southeast.

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change (Whitney and DeCant 2001). We followed the surveyors' traverse along 1700 km (1056 mi) encompassing 14 contiguous townships, approximately 130,000 ha (504 sq mi). We transcribed the surveyors' observations from their field notes to 15-minute USGS topographic quadrangles, then consolidated the information on a single sheet (Fig. 1).

The oak stands were irregularly distributed around and between the delta's wide-spreading sloughs, in the overall form of a vast scalene triangle. The impressions of early visitors were limited by line of travel and line of sight, which gave rise to widely varying estimates of the original extent of the woodland. The very liberal estimate of 100,000 ha (400 sq mi) was published by Jepson (1910) and became embedded in the literature (e.g., Griffin 2000). In fact, Hilgard's (1884) estimate of 20,000 ha (75–80 sq mi) was most accurate. One early characterization of this landscape as a complex of "wooded islands" was rather apt (Cronise 1868). However, we have not found any clear-cut physiographic explanation for the spatial pattern of the oak "islands." They do not correspond to any soil series delineated in the recent soil survey of the area (Wasner and Arroues 2000), nor do topographic maps indicate a consistent association with any facet of local relief. The natural hydrologic pattern, both winter-spring flooding and summer-fall subirrigation, has been altered so profoundly for so long (Grunsky 1898) that no comparative assessment can be made.

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